

REMARKS

Claims 11-16 and 19 are pending and stand rejected.

Claim 11 has been amended to more clearly define the layers

Claim 11 has been amended to state that the tie layer is a copolyamide (cannot be a functional olefin), that optional.

New claims 20-26 have been added.

Claims 20 and 21 define compositions of the other optional tie layers, and are supported by disclosure on page 30, lines 1-5 and page 31, lines 1-3 of the original specification.

New claims 22 to 26 are supported by original claims 12 to 16.

It is believed that no new matter is added by these amendments.

35 U.S.C. §112

Claims 11-16 and 19 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Claim 11 has been amended to state that the second optional tie layer does not exist if no layer (3) is present – as supported on page 24 of the specification.

Claims 11-16 and 19 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Specifically,

- a) In claim 11 it is unclear what is meant by “functionalized” polyolefins. This term has been deleted from the claims.
- b) In claim 11, it is unclear as to whether the optional layer (3) can be either an EVOH or a tie layer. Claim 11 has been rewritten as originally submitted, making the terms EVOH layer and tie layer clear.
- c) In claims 12, 13, and 16 there is no express antecedent basis for layer (5). The claims have been amended to properly cite layer “(4)”.
- d) In claim 14, there is no express antecedent basis for more than one layer having a composition comprising said polyamide/polyolefin blend. Claim 14 has been amended to correct the issue.

35 U.S.C. §103(a)Jadamus in view of Nakajima, Chacko, and Zimmer

Claims 11-16 and 19 stand rejected under 35 U.S.C. 103(a) as obvious over Jadamus et al et al, US 6,090,459, in view of Nakajima (US 5,376,712), and Chacko (US 6,617,377), and further in view of Zimmer (US 6,615,877)

The '459 reference fails to teach all of Applicant's claim limitations, as amended, and therefore fails to present a *prima facie* of obviousness.

The '495 reference describes the following structure:

- an outer thermoplastic layer (PA12 layer),
- an optional barrier layer (could include a bonding agent) – could be EVOH.
- a second intermediate layer of PA 12
- and an inner layer of polyamide, plus graphite fibrils. The polyamide can be impact modified with ethylene/propylene copolymers.

The '495 reference fails to teach or suggest Applicant's claimed copolyamide tie Layer (2). The '495 reference also teaches graphite fibrils – which are quite different and provide different properties than the carbon nanotubes required by Applicant's claims. The '495 reference further fails to teach a composition of layer (4), in which the carbon nanotubes concentrate in the polyamide matrix phase.

The Nakajima reference is a secondary reference cited for its teaching of impact modified polyamides, and specifically for polyamides modified with polyolefins. It does not teach or suggest a method for improving barrier properties using the structure as claimed in Applicant's amended claims, thus failing to heal the deficiencies in the Jadamus reference.

The Chacko reference is also a secondary reference, cited for its teaching that carbon nanotubes can form secondary bonding with polymers having functional groups. The Chacko patent includes in its list of representative polymers polyamide imides, however polyamides or polyolefins are not included, and therefore this reference, in combination with the other references, fails to teach or suggest that carbon nanotubes concentrate in the polyamide. The Chacko reference thus fails to heal the deficiencies of

the Jadamus and Nakajima references to teach or suggest all of Applicant's claim limitations.

The Zimmer reference is a secondary reference showing bonding layers (tie layers) can be provided between adjoining nylon layers. (PA 6 and PA12). The bonding layer can be a polyolefin like polyethylene or polypropylene. (Col 2, lines 58 – 62). There is no teaching or suggestion of using a copolyamide as the tie layer – providing a chemically similar adhesive as the PA-11 or PA-12. Thus, the Zimmer reference – as in the Chacko, Jadamus and Nakajima references fails to teach a copolyamide tie layer used inside the outer PA-11 or PA-12 layer, nor does it teach or suggest the use of carbon nanotubes.

None of the cited references, alone or together teach or suggest Applicant's claimed tube structure Consisting of:

A PA-11 or PA12/copolyamide tie layer,
optional EVOH layer that if present could have an additional tie layer, and
an inner polyamide/polyolefin blend containing 0.1 to 10% carbon nanotubes, the polyamide portion of the polyamide/polyolefin blend being from 40 to 75%, and where the carbon nanotubes concentrate in the polyamide.

Since the cited references fail to present a *prima facie* case of anticipation or obviousness over the claims as amended, Applicant believes that the reasons for rejection have been overcome, and the claims herein should be allowable to the Applicant. Accordingly, reconsideration and allowance are requested.

Respectfully submitted,



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